What is claimed is:

1. An image processing circuit compressing a dynamic range of an input image, said circuit comprising:

smoothing processing means smoothing a pixel value of the input image while preserving an edge of the input image;

correction coefficient generation means generating a gain correction coefficient according to an output value of said smoothing processing means; and

pixel value correction means correcting said pixel value of the input image on a basis of said gain correction coefficient.

2. A method for processing an image to compress a dynamic range of an input image, said method comprising the steps of:

smoothing a pixel value of the input image while preserving an edge of the input image;

generating a gain correction coefficient in accordance with an output value at said smoothing step; and

correcting said pixel value of the input image on a basis of said gain correction coefficient.

3. The method according to claim 2, said method further comprising the step of:

correcting a gradation of said pixel value corrected at said step of correcting said pixel value.

4. The method according to claim 2, said method further comprising the step of:

emphasizing a variation of said pixel value to be corrected at said step of correcting said pixel value by using a subtracted value obtained by subtracting an output value at said step of smoothing from said pixel value of the input image.

5. The method according to claim 2, said method further comprising the steps of:

eliminating noises of the input image beforehand; and

enlarging said dynamic range of the input image by multiplying said pixel value of the input image after said step of eliminating noise by a uniform gain to provide said pixel value to said steps of smoothing and correcting said pixel value.

6. The method according to claim 2, wherein said step of smoothing includes the steps of:

filtering a low frequency component from the input image;

performing a logarithmic transformation of said pixel value after said step of filtering;

performing nonlinear filtering to suppress a high frequency component of the image while preserving an edge of the image after said step of logarithmic transformation; and

performing an inverse logarithmic transformation of said pixel value after said step of nonlinear filtering.

7. The method according to claim 6, wherein,

said step of nonlinear filtering includes the step

of repeating a plurality of filtering wherein

at said plurality of filtering, said pixels value of the input image is sampled at different pitch from each other and the high frequency component of the image is suppressed while preserving edges of the image.

8. The method according to claim 6, wherein said step of nonlinear filtering is performed by sampling continuous pixels at a prescribed pitch.

9. The method according to claim 6, wherein said step of nonlinear filtering includes the steps of:

generating an approximation function approximating low frequency components of pixel values of pixels within a prescribed extent based on a pixel to be processed;

setting a region corresponding to said low frequency components on a basis of said approximation function;

replacing selectively pixel a value, which is judged to be within said region by judging whether said pixel value is within said region or not concerning respective pixel values in the prescribed extent based on said pixel to be processed, with a corresponding pixel value of said approximation function in accordance with a result of said judging; and

performing weighted addition operation of said pixel value replaced at said step of replacing.

10. The method according to claim 2, wherein said gain correction coefficient with respect to an output value at said step of smoothing has a monotonically

decreasing characteristic.

11. The method according to claim 5, wherein said step of eliminating noises includes coring processing.

12. The method according to claim 5, wherein said step of elimination noises includes processing of a median filter.

13. The method according to claim 5, wherein said step of elimination noises comprises the steps of:

replacing selectively a pixel value after judging based on a pixel value of a pixel to be processed concerning pixel values in a prescribed extent based on said pixel to be processed in accordance with said judging; and

performing weighted addition operation of said pixel value replaced at said step of replacing.

14. The method according to claim 2, said method further comprising the steps of:

normalizing a color difference signal component of said input image by means of a luminance signal component of said input image beforehand to provide a pixel value based on the luminance signal component to said steps of smoothing and correcting said pixel value; and

correcting a pixel value of said color difference signal after normalizing by means of said pixel value based on said luminance signal component after said pixel value correcting.

15. An apparatus including an image processing circuit for compressing a dynamic range of an input image, said circuit, wherein:

said image processing circuit is the image processing circuit according to claim 1.